TEJUS
CONSULTANTS

TEST REPORT	
Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

SPECIFIC GRAVITY AND WATER ABSORPTION

FINE AGGREGATE (IS-2386-PART-3)

Type of Material	M sand	Proposed Use	PCC
Location/Source	Krishnappa House road	Date of Sampling	09-02-2021
Period of Soaking	24 hours	Date of Testing	10-02-2021

Sl. No.	Test Property	TRIAL - 1	TRIAL - 2	TRIAL - 3	
A	Weight of sturated surface dry sample gm.	666	648	651	
B	Weight of oven - dry sample gm.	658	640	643	
C	Weight of Pycnometer Filled with water gm	1275	1275	1275	
D	Weight of Pycnometer + sample + water gm	1693	1682	1684	
E	Bulk specific gravity $\frac{B}{(C+A-D)}$	2.653	2.656	2.657	**2.655**
G	Absorption (%) $\frac{(A-B)*100}{B}$	1.216	1.250	1.244	**1.237**

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ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಬಿ.ಬಿ.ಎಂ.ಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

Authorised Signatory

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Test Report on Cement

Project	11.Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	Benaka Developers & Project Pvt.Ltd.
Sample ID	Cement (ACC Cement) OPC 43 Grade
Date of Sample Tested	10-02-2021
Sample Supplied By	Agency

Sl.No.	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part-5)	106 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	542 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	6 mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	28.00%	25 % to 35

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ಬಿ.ಬಿ.ಎಂ.ಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

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Project	Improvement to Drains and Asphalting to Road at SVN School Road, Krishnappa House to Venkatesh House Road in Ward No 06(Thanisandra), Byatarayanapura Sub Division	
Client	Bruhat Bengaluru Mahanagara Palike	
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore	
Contractor	Benaka Developers & Project Pvt Ltd.	
Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
	Date:	**12-02-2021**
Layer no. or level	WMM I layer	
Depth of hole	200mm	
Field density:	**1**	**2**
Chainage	**1st Main (SVN school road)'@Ch:170**	**5th 'B' Main Rd Sanchara Nagara '@Ch:50**
Wt. of wet material from hole (Ww) gms.	5988	5988
Wt. of sand+cylinder before pouring (w1) gms.	15000	15000
Wt. of sand+cylinder after pouring (w2) gms.	10595	10598
Wt. of sand in hole+ cone (w3) gms.	4405	4402
Wt. of cone gms.	1080	1080
Wt. of sand gms.	3325	3322
Bulk density of sand (ys)gm/cc	1.32	1.32
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.38	2.38
Moisture meter reading(moisture content)	6.40	6.20
Result		
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.23	2.24
MDD	2.27	2.27
OMC	6.10%	6.10%
% compaction obtained	98.42	98.70
% compaction required	98%	98%

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Consultant's Representative

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. ☎ +91 80 23[illegible]
tejusconsultants@gmail.com

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike				
Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division				
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore				
Contractor	M/S Benaka Developers and Projects Pvt Ltd				
Total Weight:	10000	gms			

SIEVE ANALYSIS

Type of Material	20 mm down size		**Proposed Use**	Concrete	
Sample Location	At Plant		**Date of Sampling**	18-04-2021	
			Date of Testing	19-04-2021	
IS Sieve Size	**Weight Retained**	**Cum. Weight Retained**	**Cum. % Retained**	**Cum. % Passing**	**Spec. Limit (%) Passing**
40.00 mm	0	0	0	100	**100**
20.00 mm	258	258	2.58	97.42	**95 - 100**
10.00 mm	4644	4902	49.02	50.98	**25 - 55**
4.75 mm	4539	9441	94.41	5.59	**0 - 10**
Pan	559	10000			

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT

Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Total Weight:	10000 gms

SIEVE ANALYSIS

Type of Material	12.5 mm down size	Proposed Use	Concrete
Sample Location	Plant	Date of Sampling	18-04-2021
		Date of Testing	19-04-2021

IS Sieve Size (in mm)	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing
20.0	0	0	0	100	100
12.5	578	578	5.78	94.22	90-100
10.0	3369	3947	39.47	60.53	40-85
4.75	5492	9439	94.39	5.61	0-10
Pan	561	10000			

Remarks : ✓ Satisfactory / Not Satisfactory

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TEST REPORT	
Clients	Bruhat Bangalore Mahanagara Palike
Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/S Benaka Developers and Projects Pvt Ltd

SIEVE ANALYSIS

Total Weight:	3000 gms				
Type of Materia	M sand		Proposed Use	Concrete	
Sample Location	At Plant		Date of Sampling	18-04-2021	
			Date of Testing	19-04-2021	
IS Sieve Size	Weight Retained	Cum. Weight Retained	Cum. % Retained	Cum. % Passing	Spec. Limit (%) Passing (Zone-II)
10.00 mm	0	0	0	100.00	100
4.75 mm	225	225	7.50	92.50	90 - 100
2.36 mm	282	507	16.90	83.10	75 - 100
1.18 mm	515	1022	34.07	65.93	55 - 90
0.600 mm	548	1570	52.33	47.67	35 -59
0.300 mm	664	2234	74.47	25.53	8-30
0.150 mm	540	2774	92.47	7.53	0 - 10
Pan	226	3000			-
Remarks :			✓ Satisfactory / Not Satisfactory		

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TEST REPORT

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Clients	BRUHAT BENGALORE MAHANAGARA PALIKE
Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Consultants	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	M/S Benaka Developers and Projects Pvt Ltd

SPECIFIC GRAVITY AND WATER ABSORPTION

FINE AGGREGATE (IS-2386-PART-3)

Type of Material	M sand	Proposed Use	Concrete
Location/Source	At Plant	Date of Sampling	18-04-2021
Period of Soaking	24 hours	Date of Testing	19-04-2021

Sl. No.	Test Property		TRIAL - 1	TRIAL - 2	TRIAL - 3	Average
A	Weight of sturated surface dry sample gm.		660	642	672	
B	Weight of oven - dry sample gm.		651	635	664	
C	Weight of Pycnometer Filled with water gm		1275	1275	1275	
D	Weight of Pycnometer + sample + water gm		1690	1678	1698	
E	Bulk specific gravity	B	2.657	2.657	2.667	**2.660**
		(C + A - D)				
G	Absorption (%)	(A - B) *100	1.382	1.102	1.205	**1.230**
		B				

Remarks : ✓ Satisfactory / Not Satisfactory

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Test Report on Cement

TEJUS

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Date of Sample Tested	19-04-2021
Sample Supplied By	Agency

Sl.No.	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 12269-1987
1	a) Initial Setting Time	IS-4031 (Part-5)	102 Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part-5)	432 Minutes	Not More than 600 Minutes
2	Soundness	IS-4031 (Part-3) By the Le-Chatelier method	6mm	Not More than 10 mm
3	Standard Consistency	IS-4031 (Part-4)	29.00%	
Remarks :		✓ Satisfactory / Not Satisfactory		

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Venkatesh House Road, Ch:44 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	20-04-2021	27-04-2021	7 days	8.425	22500	445	19.78	19.79
2	20-04-2021	27-04-2021	7 days	8.521	22500	449	19.96	
3	20-04-2021	27-04-2021	7 days	8.675	22500	442	19.64	

Remarks : Satisfactory / Not Satisfactory

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Scrop Gardan Road, Ch:40 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	20-04-2021	27-04-2021	7 days	8.321	22500	446	19.82	19.73
2	20-04-2021	27-04-2021	7 days	8.345	22500	445	19.78	
3	20-04-2021	27-04-2021	7 days	8.425	22500	441	19.60	
Remarks :	Satisfactory / Not Satisfactory							

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Manasa Public School Road, Ch:50 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26-04-2021	03-05-2021	7 days	8.715	22500	448	19.91	19.93
2	26-04-2021	03-05-2021	7 days	8.812	22500	450	20.00	
3	26-04-2021	03-05-2021	7 days	8.664	22500	447	19.87	

Remarks : Satisfactory / Not Satisfactory

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Scrop Gardan Road, Ch:105 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26-04-2021	03-05-2021	7 days	8.525	22500	448	19.91	19.85
2	26-04-2021	03-05-2021	7 days	8.632	22500	445	19.78	
3	26-04-2021	03-05-2021	7 days	8.641	22500	447	19.87	

Remarks : Satisfactory / Not Satisfactory

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Scrop Gardan Road, Ch:40 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	20-04-2021	18-05-2021	28 days	8.422	22500	710	31.56	31.57
2	20-04-2021	18-05-2021	28 days	8.436	22500	706	31.38	
3	20-04-2021	18-05-2021	28 days	8.445	22500	715	31.78	

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Venkatesh House Road, Ch:44 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	20-04-2021	18-05-2021	28 days	8.752	22500	704	31.29	31.44
2	20-04-2021	18-05-2021	28 days	8.769	22500	708	31.47	
3	20-04-2021	18-05-2021	28 days	8.812	22500	710	31.56	
Remarks :		Satisfactory / Not Satisfactory						

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Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Scrop Gardan Road, Ch:105 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26-04-2021	24-05-2021	28 days	8.626	22500	705	31.33	31.54
2	26-04-2021	24-05-2021	28 days	8.712	22500	710	31.56	
3	26-04-2021	24-05-2021	28 days	8.664	22500	714	31.73	

Remarks : Satisfactory / Not Satisfactory

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4.The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

Consultant's Representative

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. O +91 80 23287532 tejusconsultants@gmail.com

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TEJUS

Test Report on Compressive Strength of Concrete Cubes

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bangalore Mahanagar Palike
Consultant	TEJUS CONSULTANTS
Contractor	M/S Benaka Developers and Projects Pvt Ltd
Sample ID	Cement (ACC Cement) OPC 43 Grade
Grade of concrete:	M30
Size of cube:	150x150x150 mm
Reference IS code:	IS:516-1959
Sample location	Manasa Public School Road, Ch:50 (Concrete Road)

Sl.No.	Date of Casting	Date of testing	Age of Test	Weight of Cube	Area of Cube	Failure load	Compressive strength	Avg. Compressive strength
				Kg	mm^2	KN	N/mm^2	N/mm^2
1	26-04-2021	24-05-2021	28 days	8.522	22500	720	32.00	31.90
2	26-04-2021	24-05-2021	28 days	8.365	22500	718	31.91	
3	26-04-2021	24-05-2021	28 days	8.648	22500	715	31.78	

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	Tejus Consultants, Bangalore		
Contractor	M/S Benaka Developers and Projects Pvt Ltd		
Proposed Use	BC	Date of Sampling	12-08-2021
Sample Location	At plant	Date of Testing	12-08-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	378.00	365.00	351.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	285.00	275.00	265.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	93.00	90.00	86.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	24.60	24.66	24.50	
5	Average Aggregate impact value	(%)	24.59			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor:	M/S Benaka Developers and Projects Pvt Ltd

Type of Material	BC	**Proposed Use**	BC
Sample Location	At plant	**Date of Sampling**	12-08-2021
		Date of Testing	12-08-2021

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	812	75	926	73
16.0	12.5	1345	130	1236	115
12.5	10.0	518	65	440	54
10.0	6.3	455	55	430	65
Total		**3130**	**325**	**3032**	**307**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.38
Elongation Index(%):	10.13
Combined FI+EL (%)	20.51

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.66(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	13-08-2021
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	945	893
2. Weight of Mixture after extraction, g	895	846
3. Weight of Bitumen	50	47
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	1.60	2.00
7. Weight of Bitumen & fines	51.60	49.00
8. Bitumen content in %	5.46	5.49
9. Average Bitumen content in %	**5.47**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	1st Main (SVN school road)	Date of Sampling:	13-08-2021
Type of material & Purpose:	BC	Date of testing:	13-08-2021
		Oven Dry Wt.(gms):	895.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	82	82.0	9.16	90.84	79 - 100
9.50	125	207.0	23.13	76.87	71 - 95
4.75	133	340.0	37.99	62.01	53 - 71
2.360	115	455.0	50.84	49.16	42 - 58
1.180	102	557.0	62.23	37.77	34 - 48
0.600	75	632.0	70.61	29.39	26 - 38
0.300	82	714.0	79.78	20.22	18 - 28
0.150	60	774.0	86.48	13.52	12 - 20
0.075	73	847.0	94.64	5.36	4 - 10
Pan	48.0				
Total	895.0				

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.66Thamisandra), Byatarayanapura Sub Division
Client :	BBCI'IAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Renuka Developers and Projects Pvt Ltd
Date of Testing :	13.08.2021
Type of Mix :	BC
Sample I/D :	BC2

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	966	921
2. Weight of Mixture after extraction, g	915	873
3. Weight of Bitumen	51	48
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	1.60	2.00
7. Weight of Bitumen & fines	52.60	50.00
8. Bitumen content in %	5.45	5.43
9. Average Bitumen content in %	5.44	
10. Minimum Bitumen content in %	5.40	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	5th 'E' Main Rd Sanchara Nagara	Date of Sampling:	13-08-2021
Type of material & Purpose:	BC	Date of testing:	13-08-2021
		Oven Dry Wt.(gms):	915.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	78	78.0	8.52	91.48	79 - 100
9.50	108	186.0	20.33	79.67	71 - 95
4.75	136	322.0	35.19	64.81	53 - 71
2.360	120	442.0	48.31	51.69	42 - 58
1.180	106	548.0	59.89	40.11	34 - 48
0.600	78	626.0	68.42	31.58	26 - 38
0.300	83	709.0	77.49	22.51	18 - 28
0.150	68	777.0	84.92	15.08	12 - 20
0.075	72	849.0	92.79	7.21	4 - 10
Pan	66.0				
Total	915.0				

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	13-08-2021
Type of Mix :	BC
Sample I/D :	BC3

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	889	917
2. Weight of Mixture after extraction, g	842	869
3. Weight of Bitumen	47	48
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	1.60	2.00
7. Weight of Bitumen & fines	48.60	50.00
8. Bitumen content in %	5.47	5.45
9. Average Bitumen content in %	**5.46**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	7th 'B' Main Rd Sanchara Nagara	Date of Sampling:	13-08-2021
Type of material & Purpose:	BC	Date of testing:	13-08-2021
		Oven Dry Wt.(gms):	842.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	79	79.0	9.38	90.62	79 - 100
9.50	105	184.0	21.85	78.15	71 - 95
4.75	122	306.0	36.34	63.66	53 - 71
2.360	106	412.0	48.93	51.07	42 - 58
1.180	98	510.0	60.57	39.43	34 - 48
0.600	80	590.0	70.07	29.93	26 - 38
0.300	75	665.0	78.98	21.02	18 - 28
0.150	62	727.0	86.34	13.66	12 - 20
0.075	68	795.0	94.42	5.58	4 - 10
Pan	47.0				
Total	842.0				

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	13-08-2021
Type of Mix :	Tack coat
Sample I/D :	2
Location	5th 'B' Main Rd Sanchara Nagara

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Location	**Chainage**	**@35**	**@80**	**@110**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.802	0.764	0.815
Final weight of plate after application of tack Coat (c)	Kg	0.825	0.787	0.838
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.251	0.252	0.252
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement to Drains and Asphalting to Road at SVN School Road Krishnappa House to Venkatesh House Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	13-08-2021
Type of Mix :	Tack coat
Sample I/D :	3
Location	7th 'B' Main Rd Sanchara Nagara

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Location	**Chainage**	**@30**	**@85**	**@115**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.785	0.794	0.763
Final weight of plate after application of tack Coat (c)	Kg	0.808	0.817	0.786
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.253	0.254	0.253
Average	Kg/sq.m	0.254		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	Bruhat Bengaluru Mahanagara Palike		
Consultant	TEJUS CONSULTANTS, Basaveshwar Nagar Bangalore		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	WMM	**Date of Sampling**	15.09.2020
Sample Location	Hunse Marad Krishnappa layout c/s Roads	**Date of Testing**	16.09.2020

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	352.00	349.00	368.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	263.00	259.00	274.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	89.00	90.00	94.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	25.28	25.79	25.54	
5	Average Aggregate impact value	(%)	25.54			Max - 30 %

Remarks : ✓ Satisfactory / Not Satisfactory

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No. 166 (Kamakshipalya) Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	Proposed Use	WMM
Sample Location	Hunse Marad Krishnappa layout 5th 6th C	Date of Sampling	15.09.2020
		Date of Testing	16.09.2020

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	633	85	523	81
16.0	12.5	1152	114	1005	117
12.5	10.0	755	62	721	55
10.0	6.3	624	60	559	41
Total		**3164**	**321**	**2808**	**294**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.15
Elongation Index(%):	10.47
Combined FI+EL (%)	20.62

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.96(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	Proposed Use	WMM
Sample Location	Hunse Marad Krishnappa layout 7th c/s R	Date of Sampling	15.09.2020
		Date of Testing	16.09.2020

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	642	85	528	82
16.0	12.5	1142	112	1008	114
12.5	10.0	762	64	725	56
10.0	6.3	633	58	562	45
Total		3179	319	2823	297

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.03
Elongation Index(%):	10.52
Combined FI+EL (%)	20.56

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Consultant's Representative

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GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	16.09.2020
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	Hunse Marad Krishnappa layout 5th 6th c/s Rd	Date of Sampling:	15.09.2020
		Date of testing:	16.09.2020
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	385	385	3.85	96.15	95-100
22.4	2447	2832	28.32	71.68	60-80
11.2	2545	5377	53.77	46.23	40-60
4.75	1447.0	6824	68.24	31.76	25-40
2.36	893.0	7717	77.17	22.83	15-30
0.6	821.0	8538	85.38	14.62	8.0-22.0
0.075	941.0	9479	94.79	5.21	0-8
Pan	521.0	10000			
Total	10000.0				

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Consultant's Representative

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No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. O : +91 80 23287532, tejusconsultants@gmail.com

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)			
Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Date of Testing	23.09.2020		
Layer no. or level	WMM I layer		
Depth of hole	250mm		
Field density:	**1**	**2**	**3**
Chainage	**5th c/s road (Krishnappa road)'@85**	**5th c/s road (Krishnappa road)'@130**	**5th c/s road (Krishnappa road)'@205**
Wt. of wet material from hole (Ww) gms.	6125	6108	6125
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9775	9752	9755
Wt. of sand in cone (w3) gms.	837	848	836
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3388	3400	3409
Bulk density of sand (ys)gm/cc	1.31	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (yb)=(Ww/w4*(ys))gm/cc	2.37	2.37	2.35
Moisture meter reading(moisture content)	12.45	12.56	12.57
Result			
FDD(Wt.of the dry material)=(100yb/100+mc)gm/cc	2.11	2.11	2.09
MDD	2.13	2.13	2.13
OMC	12.60%	12.60%	12.60%
% of Compaction Obtained	98.88	98.91	98.16
Compaction Required	98%	98%	98%

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Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	BC	**Date of Sampling**	**05-07-2021**
Sample Location	At plant	**Date of Testing**	**05-07-2021**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	366.00	352.00	379.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	281.00	266.00	287.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	85.00	86.00	92.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	23.22	24.43	24.27	
5	Average Aggregate impact value	(%)	23.98			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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Project	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.66(Thanisandra), Byatarayanapura Sub Division
Client	Brubat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt Ltd

FLAKINESS AND ELONGATION INDICES (IS 2386, PART I)

Type of Material	BC		Proposed Use	BC
Sample Location	At plant		Date of Sampling	5-07-2021
			Date of Testing	5-07-2021

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	941	86	931	79
16.0	12.5	1320	113	1254	127
12.5	10.0	521	73	444	52
10.0	6.3	491	64	432	66
Total		3273	336	3061	324

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.27
Elongation Index(%):	10.58
Combined FI+EL (%)	20.85

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work	:	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No 06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt Ltd.
Date of Testing	:	6-07-2021
Type of Mix	:	BC
Sample I/D	:	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	901	920
2. Weight of Mixture after extraction, g	854	872
3. Weight of Bitumen	47	48
4. Weight of filter paper before extraction, g	2.00	2.15
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	2.10	1.85
7. Weight of Bitumen & fines	49.10	49.85
8. Bitumen content in %	5.45	5.42
9. Average Bitumen content in %	**5.43**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	Hunse Marad Krishnappa layout 5th 6th c/s Rds	Date of Sampling:	6-07-2021
		Date of testing:	6-07-2021
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	854.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	84	84.0	9.84	90.16	79 - 100
9.50	106	190.0	22.25	77.75	71 - 95
4.75	105	295.0	34.54	65.46	53 - 71
2.360	112	407.0	47.66	52.34	42 - 58
1.180	103	510.0	59.72	40.28	34 - 48
0.600	97	607.0	71.08	28.92	26 - 38
0.300	62	669.0	78.34	21.66	18 - 28
0.150	54	723.0	84.66	15.34	12 - 20
0.075	86	809.0	94.73	5.27	4 - 10
Pan	45.0	854.0			
Total	854.0				

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	06-07-2021
Type of Mix :	Tack coat
Sample I/D :	1
Sample Location	Hunse Marad Krishnappa layout 5th 5th c/s Rds

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Chainage		**@30**	**@75**	**@110**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.776	0.764	0.796
Final weight of plate after application of tack Coat (c)	Kg	0.799	0.787	0.819
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.251	0.253	0.250
Average	Kg/sq.m	0.251		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement to Roads and Drains at Hunnasemarada Krishnappa Layout in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	06-07-2021
Type of Mix :	Tack coat
Sample I/D :	2
Sample Location	Hunse Marad Krishnappa layout 7th c/s Rd

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Chainage		**@59**	**@162**	**@202**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.785	0.767	0.803
Final weight of plate after application of tack Coat (c)	Kg	0.808	0.790	0.826
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.251	0.256	0.251
Average	Kg/sq.m	0.253		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	Bruhat Bengaluru Mahanagara Palike		
Consultant	TEJUS CONSULTANTS, Basaveshwar Nagar Bangalore		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	WMM	**Date of Sampling**	27-09-2020
Sample Locati	**Parasu Manyatha Apartment to St.Ann's Church**	**Date of Testing**	28-09-2020

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	362.00	368.00	351.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	267.00	269.00	258.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	95.00	99.00	93.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	26.24	26.90	26.50	
5	Average Aggregate impact value	(%)	26.55			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	Proposed Use	WMM
Sample Location	Parasu Manyatha Apartment to St.Ann's Church	Date of Sampling	27.09.2020
		Date of Testing	28.09.2020

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	657	85	523	81
16.0	12.5	1141	114	1005	117
12.5	10.0	747	62	721	55
10.0	6.3	625	60	559	41
Total		**3170**	**321**	**2808**	**294**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.13
Elongation Index(%):	10.47
Combined FI+EL (%)	20.60

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	Proposed Use	WMM
Sample Location	Parasu Manyatha Apartment to St.Ann's Church	Date of Sampling	27.09.2020
		Date of Testing	28.09.2020

Size of aggregate		Flakiness Index		Elongation Index	
Passing through IS sieve, mm	Retained on IS sieve, mm	Total wt. of aggregate retained on sieves (A) gms.	Wt. of aggregate passing from Flakiness gauge (B) gms	Wt. of aggregate retained on Flakiness gauge (C) gms	Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	654	85	523	81
16.0	12.5	1152	114	1005	117
12.5	10.0	747	62	721	55
10.0	6.3	625	60	559	41
Total		3178	321	2808	294

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.10
Elongation Index(%):	10.47
Combined FI+EL (%)	20.57

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	**Proposed Use**	WMM
Sample Location	Burial ground to Parasu Manyatha Apartment	**Date of Sampling**	27.09.2020
		Date of Testing	28.09.2020

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	650	82	525	82
16.0	12.5	1146	117	1008	115
12.5	10.0	740	63	722	59
10.0	6.3	620	58	562	42
Total		**3156**	**320**	**2817**	**298**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.14
Elongation Index(%):	10.58
Combined FI+EL (%)	20.72

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TEJUS

GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	28.09.2020
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	Parasu Manyatha Apartment to St.Ann's Church	Date of Sampling:	27.09.2020
		Date of testing:	28.09.2020
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	374	374	3.74	96.26	95-100
22.4	2444	2818	28.18	71.82	60-80
11.2	2587	5405	54.05	45.95	40-60
4.75	1467.0	6872	68.72	31.28	25-40
2.36	885.0	7757	77.57	22.43	15-30
0.6	821.0	8578	85.78	14.22	8.0-22.0
0.075	941.0	9519	95.19	4.81	0-8
Pan	481.0	10000			
Total	10000				

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Consultant's Representative

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No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079, ☎ +91 80 23287532, tejusconsultants@gmail.com

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TEJUS

GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	29.09.2020
Type of Mix	:	WMM
Sample I/D	:	WMM 3

Sample Location:	Burial ground to Parasu Manyatha Apartment	Date of Sampling:	28.09.2020
		Date of testing:	29.09.2020
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	388	388	3.88	96.12	95-100
22.4	2459	2847	28.47	71.53	60-80
11.2	2588	5435	54.35	45.65	40-60
4.75	1455.0	6890	68.90	31.10	25-40
2.36	885.0	7775	77.75	22.25	15-30
0.6	821.0	8596	85.96	14.04	8.0-22.0
0.075	941.0	9537	95.37	4.63	0-8
Pan	463.0	10000			
Total	10000.0				

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GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	29.09.2020
Type of Mix	:	WMM
Sample I/D	:	WMM 4

Sample Location:	Burial ground to Parasu Manyatha Apartment	Date of Sampling:	28.09.2020
		Date of testing:	29.09.2020
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	367	367	3.67	96.33	95-100
22.4	2385	2752	27.52	72.48	60-80
11.2	2514	5266	52.66	47.34	40-60
4.75	1422.0	6688	66.88	33.12	25-40
2.36	880.0	7568	75.68	24.32	15-30
0.6	820.0	8388	83.88	16.12	8.0-22.0
0.075	935.0	9323	93.23	6.77	0-8
Pan	677.0	10000			
Total	10000				

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TEJUS
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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division	
Client	BRUHAT BANGALORE MAHANAGARA PALIKE	
Consultant	M/s Tejus Consultants	
Contractor	Benaka Developers & Project Pvt.Ltd.	
Date of Testing	05.10.2020	
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	**1**	**2**
Chainage	**Parasu Manyatha Apartment to St.Ann's Church '@35**	**Parasu Manyatha Apartment to St.Ann's Church '@90**
Wt. of wet material from hole (Ww) gms.	6172	6185
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9752	9712
Wt. of sand in cone (w3) gms.	826	841
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3422	3447
Bulk density of sand (γs)gm/cc	1.31	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.36	2.37
Moisture meter reading(moisture content)	12.45	12.56
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.10	2.10
MDD	2.13	2.13
OMC	12.60%	12.60%
% of Compaction Obtained	98.65	98.79
Compaction Required	98%	98%

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division	
Client	BRUHAT BANGALORE MAHANAGARA PALIKE	
Consultant	M/s Tejus Consultants	
Contractor	Benaka Developers & Project Pvt.Ltd.	
Date of Testing	05.10.2020	
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	1	2
Chainage	Parasu Manyatha Apartment to St.Ann's Church '@280	Parasu Manyatha Apartment to St.Ann's Church '@325
Wt. of wet material from hole (Ww) gms.	6145	6166
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9774	9712
Wt. of sand in cone (w3) gms.	826	832
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3400	3456
Bulk density of sand (γs)gm/cc	1.31	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.36
Moisture meter reading(moisture content)	12.45	12.56
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.11	2.09
MDD	2.13	2.13
OMC	12.60%	12.60%
% of Compaction Obtained	98.85	98.23
Compaction Required	98%	98%

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division	
Client	BRUHAT BANGALORE MAHANAGARA PALIKE	
Consultant	M/s Tejus Consultants	
Contractor	Benaka Developers & Project Pvt.Ltd.	
Date of Testing	06.10.2020	
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	**1**	**2**
Chainage	**Parasu Manyatha Apartment to St.Ann's Church '@370**	**Parasu Manyatha Apartment to St.Ann's Church '@405**
Wt. of wet material from hole (Ww) gms.	6144	6128
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9775	9742
Wt. of sand in cone (w3) gms.	826	841
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3399	3417
Bulk density of sand (γs)gm/cc	1.31	1.32
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.37
Moisture meter reading(moisture content)	12.45	12.56
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.11	2.10
MDD	2.13	2.13
OMC	12.60%	12.60%
% of Compaction Obtained	98.86	98.74
Compaction Required	98%	98%

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division	
Client	BRUHAT BANGALORE MAHANAGARA PALIKE	
Consultant	M/s Tejus Consultants	
Contractor	Benaka Developers & Project Pvt.Ltd.	
Date of Testing	06.10.2020	
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	**1**	**2**
Chainage	**Burial ground to Parasu Manyatha Apartment '@70**	**Burial ground to Parasu Manyatha Apartment '@155**
Wt. of wet material from hole (Ww) gms.	6144	6133
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9755	9755
Wt. of sand in cone (w3) gms.	836	836
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3409	3409
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.36	2.36
Moisture meter reading(moisture content)	12.57	12.57
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.10	2.09
MDD	2.13	2.13
OMC	12.60%	12.60%
% of Compaction Obtained	98.47	98.29
Compaction Required	98%	98%

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)		
Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division	
Client	BRUHAT BANGALORE MAHANAGARA PALIKE	
Consultant	M/s Tejus Consultants	
Contractor	Benaka Developers & Project Pvt.Ltd.	
Date of Testing	06.10.2020	
Layer no. or level	WMM I layer	
Depth of hole	250mm	
Field density:	3	3
Chainage	Burial ground to Parasu Manyatha Apartment '@210	Burial ground to Parasu Manyatha Apartment '@280
Wt. of wet material from hole (Ww) gms.	6132	6140
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9755	9755
Wt. of sand in cone (w3) gms.	836	836
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3409	3409
Bulk density of sand (γs)gm/cc	1.31	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.36	2.36
Moisture meter reading(moisture content)	12.57	12.57
Result		
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.09	2.10
MDD	2.13	2.13
OMC	12.60%	12.60%
% of Compaction Obtained	98.28	98.40
Compaction Required	98%	98%

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Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	DBM	**Date of Sampling**	**20.12.2020**
Sample Location	At plant	**Date of Testing**	**20.12.2020**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	370.00	369.00	358.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	281.00	280.00	272.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	89.00	89.00	86.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	24.05	24.12	24.02	
5.	Average Aggregate impact value	(%)	24.07			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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BITUMEN CONTENT AND GRADATION DETERMINATION OF DENSE BITUMINOUS MACADAM MIX

Name of Work	:	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	22.12.2020
Type of Mix	:	DBM
Sample I/D	:	DBM-1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	852	922
2. Weight of Mixture after extraction, g	815	882
3. Weight of Bitumen	37	40
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.00	4.00
6. Weight of fines, g	2.00	2.00
7. Weight of Bitumen & fines	39.00	42.00
8. Bitumen content in %	4.58	4.56
9. Average Bitumen content in %	4.57	
10. Minimum Bitumen content in %	4.50	

GRADATION FOR DBM AFTER EXTRACTION

(As per MORT&H 500-10,Grading-2)

Sample Location:	Parasu Manyatha Apartment to St.Ann's Church	**Date of Sampling:**	22.12.2020
		Date of testing:	22.12.2020
Type of material & Purpose:	DBM	**Oven Dry Wt.(gms):**	815

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
37.50	0.0	0.0	0.00	100.00	100.00
26.50	40.0	40.0	4.91	95.09	90-100
19.00	126.0	166.0	20.37	79.63	71-95
13.20	112.0	278.0	34.11	65.89	56-80
4.750	154.0	432.0	53.01	46.99	38-54
2.360	98.0	530.0	65.03	34.97	28-42
0.300	176.0	706.0	86.63	13.37	7-21
0.075	64.0	770.0	94.48	5.52	2-8
Pan	45.0	815.0			
Total	815.0				

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DETERMINATION OF RATE OF SPREAD TACK COAT				
Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division			
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE			
Consultant :	M/s Tejus Consultants			
Contractor :	Benaka Developers & Project Pvt.Ltd.			
Date of Testing :	22.12.2020			
Type of Mix :	Tack coat			
Sample I/D :	1			
Sample Location	Parasu Manyatha Apartment to St.Ann's Church			
Determination	**Unit**	**Test No**		
		1	**2**	**3**
Chainage		**@160**	**@240**	**@365**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.788	0.756	0.774
Final weight of plate after application of tack Coat (c)	Kg	0.811	0.779	0.797
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.252	0.251	0.253
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	22.12.2020
Type of Mix :	Tack coat
Sample I/D :	2
Sample Location	Parasu Manyatha Apartment to St.Ann's Church

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Chainage		**@210**	**@250**	**@280**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.759	0.765	0.779
Final weight of plate after application of tack Coat (c)	Kg	0.782	0.788	0.802
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.252	0.253	0.253
Average	Kg/sq.m	0.253		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT				
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Client :	BRUHAT BANGALORE MAHANAGARA PALIKE			
Consultant :	M/s Tejus Consultants			
Contractor :	Benaka Developers & Project Pvt.Ltd.			
Date of Testing :	22.12.2020			
Type of Mix :	Tack coat			
Sample I/D :	3			
Sample Location	Parasu Manyatha Apartment to St.Ann's Church			
Determination	**Unit**	**Test No**		
		1	**2**	**3**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.792	0.722	0.772
Final weight of plate after application of tack Coat (c)	Kg	0.815	0.745	0.795
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.256	0.256	0.253
Average	Kg/sq.m	0.255		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT				
Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division			
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE			
Consultant :	M/s Tejus Consultants			
Contractor :	Benaka Developers & Project Pvt.Ltd.			
Date of Testing :	22.12.2020			
Type of Mix :	Tack coat			
Sample I/D :	3			
Sample Location	Parasu Manyatha Apartment to St.Ann's Church			
Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.792	0.722	0.772
Final weight of plate after application of tack Coat (c)	Kg	0.815	0.745	0.795
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.256	0.256	0.253
Average	Kg/sq.m	0.255		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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Consultant's Representative

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. O +91 80 23287532. tejusconsultants@gmail.com

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	22.12.2020
Type of Mix :	Tack coat
Sample I/D :	4
Sample Location	Burial ground to Parasu Manyatha Apartment

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.780	0.786	0.764
Final weight of plate after application of tack Coat (c)	Kg	0.803	0.809	0.787
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.253	0.250	0.253
Average	Kg/sq.m	0.252		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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Authorised Signatory

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	22.12.2020
Type of Mix :	Tack coat
Sample I/D :	5
Sample Location	Burial ground to Parasu Manyatha Apartment

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.744	0.783	0.778
Final weight of plate after application of tack Coat (c)	Kg	0.767	0.806	0.801
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.253	0.254	0.251
Average	Kg/sq.m	0.253		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	22.12.2020
Type of Mix :	Tack coat
Sample I/D :	6
Sample Location	Burial ground to Parasu Manyatha Apartment

Determination	Unit	Test No		
		1	2	3
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.740	0.710	0.700
Final weight of plate after application of tack Coat (c)	Kg	0.762	0.733	0.723
Weight of tack Coat (d=c-b)	Kg	0.022	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.244	0.253	0.252
Average	Kg/sq.m	0.250		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

Proposed Use	BC	**Date of Sampling**	**25.01.2021**
Sample Location	At plant	**Date of Testing**	**26.01.2021**

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	389.00	367.00	376.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	294.00	277.00	283.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	95.00	90.00	93.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	24.42	24.52	24.73	
5	Average Aggregate impact value	(%)	24.56			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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Consultant's Representative

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Project	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt Ltd,

FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Type of Material	BC		**Proposed Use**	BC
Sample Location	At plant		**Date of Sampling**	25.01.2021
			Date of Testing	25.01.2021

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	955	89	930	75
16.0	12.5	1315	114	1250	125
12.5	10.0	518	76	444	52
10.0	6.3	495	64	433	62
Total		**3283**	**343**	**3057**	**314**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.45
Elongation Index(%):	10.27
Combined FI+EL (%)	20.72

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work	:	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	27.01.2021
Type of Mix	:	BC
Sample I/D	:	BC2

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	937	953
2. Weight of Mixture after extraction, g	888	903
3. Weight of Bitumen	49	50
4. Weight of filter paper before extraction, g	2.00	2.15
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	2.10	1.85
7. Weight of Bitumen & fines	51.10	51.85
8. Bitumen content in %	5.45	5.44
9. Average Bitumen content in %	**5.45**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION

(As per MORT&H 500-18,Grading-2)

Sample Location:	Burial ground to Parasu Manyatha Apartment	Date of Sampling:	27.01.2021
		Date of testing:	27.01.2021
Type of material & Purpose:	BC	Oven Dry Wt.(gms):	888.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	84	84.0	9.46	90.54	79 - 100
9.50	120	204.0	22.97	77.03	71 - 95
4.75	97	301.0	33.90	66.10	53 - 71
2.360	149	450.0	50.68	49.32	42 - 58
1.180	117	567.0	63.85	36.15	34 - 48
0.600	69	636.0	71.62	28.38	26 - 38
0.300	75	711.0	80.07	19.93	18 - 28
0.150	46	757.0	85.25	14.75	12 - 20
0.075	72	829.0	93.36	6.64	4 - 10
Pan	59.0	888.0			
Total	888.0				

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Rachenahali Circle to Burial Ground in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	M/s Tejus Consultants
Contractor :	Benaka Developers & Project Pvt.Ltd.
Date of Testing :	27.01.2021
Type of Mix :	Tack coat
Sample I/D :	2
Sample Location	Parasu Manyatha Apartment to St.Ann's Church

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Chainage		**@80**	**@170**	**@275**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.786	0.767	0.802
Final weight of plate after application of tack Coat (c)	Kg	0.809	0.790	0.825
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.251	0.256	0.251
Average	Kg/sq.m	0.253		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	Bruhat Bengaluru Mahanagara Palike		
Consultant	TEJUS CONSULTANTS, Basaveshwar Nagar Bangalore		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Proposed Use	WMM	**Date of Sampling**	07.08.2020
Sample Location	Bhuvaneshwari Nagar (17th c/s Rd)	**Date of Testing**	08.08.2020

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	361.00	368.00	356.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	267.00	269.00	260.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	94.00	99.00	96.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	26.04	26.90	26.97	
5	Average Aggregate impact value	(%)	26.64			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	Bruhat Bengaluru Mahanagara Palike
Consultant	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	Benaka Developers & Project Pvt.Ltd.

Type of Material	WMM	**Proposed Use**	WMM
Sample Location	Bhuvaneshwari Nagar (17th c/s Rd)	**Date of Sampling**	07.08.2020
		Date of Testing	08.08.2020

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	652	85	523	81
16.0	12.5	1174	114	1005	117
12.5	10.0	747	62	721	55
10.0	6.3	625	60	559	41
Total		**3198**	**321**	**2808**	**294**

Note: Minimum 200 Pcs should be taken on each fraction of test

	Flakiness Index(%):	10.04
	Elongation Index(%):	10.47
	Combined FI+EL (%)	20.51

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TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079. ✆ +91 80 23287532, tejusconsultants@gmail.com

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GRADATION FOR WMM
(As per MORT&H 400-11)

Name of Work	:	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client	:	Bruhat Bengaluru Mahanagara Palike
Consultant	:	TEJUS CONSULTANTS Basaveshwar Nagar Bangalore
Contractor	:	Benaka Developers & Project Pvt.Ltd.
Date of Testing	:	08.08.2020
Type of Mix	:	WMM
Sample I/D	:	WMM 1

Sample Location:	Bhuvaneshwari Nagar (17th c/s Rd)	Date of Sampling:	07.08.2020
		Date of testing:	08.08.2020
Type of material & Purpose:	WMM	Oven Dry Wt.(gms):	10000.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
53	0	0	0.00	100.00	100.00
45	342	342	3.42	96.58	95-100
22.4	2445	2787	27.87	72.13	60-80
11.2	2587	5374	53.74	46.26	40-60
4.75	1457.0	6831	68.31	31.69	25-40
2.36	885.0	7716	77.16	22.84	15-30
0.6	821.0	8537	85.37	14.63	8.0-22.0
0.075	941.0	9478	94.78	5.22	0-8
Pan	522.0	10000			
Total	10000.0				

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Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)			
Project	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	M/s Tejus Consultants		
Contractor	Benaka Developers & Project Pvt.Ltd.		
Date of Testing	10.08.2020		
Layer no. or level	WMM I layer		
Depth of hole	250mm		
Field density:	1	2	3
Chainage	Bhuvaneshwari Nagar (17th c/s Rd) '@75	Bhuvaneshwari Nagar (17th c/s Rd) '@110	Bhuvaneshwari Nagar (17th c/s Rd) '@230
Wt. of wet material from hole (Ww) gms.	6142	6115	6175
Wt. of sand+cylinder before pouring (w1) gms.	14000	14000	14000
Wt. of sand+cylinder after pouring (w2) gms.	9775	9770	9755
Wt. of sand in cone (w3) gms.	826	822	836
Wt. of sand in hole (w4)=(w1-w2-w3) gms.	3399	3408	3409
Bulk density of sand (γs)gm/cc	1.31	1.32	1.31
Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc	2.37	2.37	2.37
Moisture meter reading(moisture content)	12.45	12.56	12.57
Result			
FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc	2.11	2.10	2.11
MDD	2.13	2.13	2.13
OMC	12.60%	12.60%	12.60%
% of Compaction Obtained	98.83	98.79	98.96
Compaction Required	98%	98%	98%

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AGGREGATE IMPACT VALUE
(IS: 2386 Part - 4)

Project	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division		
Client	BRUHAT BANGALORE MAHANAGARA PALIKE		
Consultant	Tejus Consultants, Bangalore		
Contractor	M/S Benaka Developers and Projects Pvt Ltd		
Proposed Use	BC	**Date of Sampling**	17-03-2021
Sample Location	At plant	**Date of Testing**	17-03-2021

Sl. No.	Description		Test No. 1	Test No. 2	Test No. 3	Spec Limit (%)
1	Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm)	(Wa)	358.00	336.00	362.00	
2	Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm)	(Wb)	275.00	258.00	278.00	
3	Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm)	(Wc)	83.00	78.00	84.00	
4	Aggregate Impact Value (%)	(Wc/Wa)*100	23.18	23.21	23.20	
5	Average Aggregate impact value	(%)	23.20			Max - 30 %

Remarks : Satisfactory / Not Satisfactory

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ಬಿ.ಬಿ.ಎಂ.ಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

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ಬಿ.ಬಿ.ಎಂ.ಪಿ, ಬೆಂಗಳೂರು-28

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FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

Project :	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor:	M/S Benaka Developers and Projects Pvt Ltd

Type of Material	BC	**Proposed Use**	BC
Sample Location	At plant	**Date of Sampling**	17-03-2021
		Date of Testing	17-03-2021

Size of aggregate		**Flakiness Index**		**Elongation Index**	
Passing through IS sieve, mm	**Retained on IS sieve, mm**	**Total wt. of aggregate retained on sieves (A) gms.**	**Wt. of aggregate passing from Flakiness gauge (B) gms**	**Wt. of aggregate retained on Flakiness gauge (C) gms**	**Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms**
63.0	50.0	0	0	0	0
50.0	40.0	0	0	0	0
40.0	31.5	0	0	0	0
31.5	25.0	0	0	0	0
25.0	20.0	0	0	0	0
20.0	16.0	811	73	931	75
16.0	12.5	1352	128	1242	118
12.5	10.0	515	66	442	56
10.0	6.3	448	58	436	69
Total		**3126**	**325**	**3051**	**318**

Note: Minimum 200 Pcs should be taken on each fraction of test

Flakiness Index(%):	10.40
Elongation Index(%):	10.42
Combined FI+EL (%)	20.82

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4. The material used in the site satisfied the standard of MORTH's 5th revision and hence can be used in the work.

Authorised Signatory

TEJUS CONSULTANTS

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore - 560079, O : +91 80 23287532, tejusconsultants@gm

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BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

Name of Work :	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	18.03.2021
Type of Mix :	BC
Sample I/D :	BC1

DETERMINATION OF BITUMEN CONTENT

Description	Trail 1	Trail 2
1. Weight of Mixture before extraction, g	961	902
2. Weight of Mixture after extraction, g	910	855
3. Weight of Bitumen	51	47
4. Weight of filter paper before extraction, g	2.00	2.00
5. Weight of filter paper after extraction, g	4.10	4.00
6. Weight of fines, g	1.60	2.00
7. Weight of Bitumen & fines	52.60	49.00
8. Bitumen content in %	5.47	5.43
9. Average Bitumen content in %	**5.45**	
10. Minimum Bitumen content in %	**5.40**	

GRADATION FOR BC AFTER EXTRACTION
(As per MORT&H 500-18,Grading-2)

Sample Location:	Bhuvaneshwari Nagar (17th c/s rd)	Date of Sampling:	18.03.2021
Type of material & Purpose:	BC	Date of testing:	18.03.2021
		Oven Dry Wt.(gms):	910.0

IS Sieve size in mm	Weight retained	Cummulative weight retained (gm)	Cummulative % of retained	Cummulative % of passing	Specification limits
19.00	0	0	0.00	100.00	100.00
13.20	85	85.0	9.34	90.66	79 - 100
9.50	126	211.0	23.19	76.81	71 - 95
4.75	135	346.0	38.02	61.98	53 - 71
2.360	116	462.0	50.77	49.23	42 - 58
1.180	108	570.0	62.64	37.36	34 - 48
0.600	74	644.0	70.77	29.23	26 - 38
0.300	80	724.0	79.56	20.44	18 - 28
0.150	62	786.0	86.37	13.63	12 - 20
0.075	71	857.0	94.18	5.82	4 - 10
Pan	53.0				
Total	910.0				

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TEJUS CONSULTANTS

Authorised Signatory

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage KHB Colony, Basaveshwaranagar, Bangalore-560079, O : +91 80 23287532, tejusconsultants@gmail.com

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DETERMINATION OF RATE OF SPREAD TACK COAT

Name of Work :	Improvement of Drains and Asphalting to Road at Bhuvaneshwarinagara Cross Roads in Ward No.06(Thanisandra), Byatarayanapura Sub Division
Client :	BRUHAT BANGALORE MAHANAGARA PALIKE
Consultant :	Tejus Consultants, Bangalore
Contractor :	M/S Benaka Developers and Projects Pvt Ltd
Date of Testing :	18-03-2021
Type of Mix :	Tack coat
Sample I/D :	1
Location	Bhuvaneshwari Nagar (17th c/s road)

Determination	**Unit**	**Test No**		
		1	**2**	**3**
Location	**Chainage**	**@80**	**@165**	**@235**
Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30	0.30 x .30
Area of Plate (a)	Sq.mtr	0.09	0.09	0.09
Initial Wt of empty Plate (b)	Kg	0.804	0.782	0.795
Final weight of plate after application of tack Coat (c)	Kg	0.827	0.805	0.818
Weight of tack Coat (d=c-b)	Kg	0.023	0.023	0.023
Rate of spread of tack coat	Kg/sq.m	0.251	0.251	0.251
Average	Kg/sq.m	0.251		
Specified Limit	Kg/sq.m	**0.250 Kg/sq.m**		

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